REMARKS/ARGUMENTS

Claim Rejections under 35 U.S.C. §103

The Office Action indicated that claims 2, 4, 6, 7, 9, 12, 14, 15, 16, 17, 19, 22 and 24-27 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. However, the Office Action rejected claims 1, 3, 5, 8, 11, 13, 18, 20, 21 and 23 under 35 U.S.C. 103 as being unpatentable over U.S. Published Application No. 2003/0189952 to Long et al. (the Long reference) in view of US Patent 6,678,316 to Helms et al. (the Helms reference). Applicants respectfully traverse this rejection because neither the Long reference nor the Helms reference, either alone or in combination, disclose or suggest the elements of these claims.

Independent Claim 1 and Dependent Claims 2 through 7

First, with respect to the Long reference, it fails to disclose or suggest the requirements of claim 1 of, "transmitting, by a remote DSL transceiver, first signals containing even numbered carriers for a predetermined period of time to initiate the DSL handshaking to produce R-ETONES-REQ; detecting, by a central office DSL transceiver, the R-ETONES-REQ to produce detected R-ETONES-REQ; determining, by the central office DSL transceiver, alignment of a hyperframe in accordance with a Time Compression Multiplexing – Integrated Service Digital Network (TCM-ISDN) Timing Reference (TTR); transmitting, by the central office DSL transceiver, first response signals containing odd numbered carriers in accordance with the alignment of the hyperframe to produce C-TONES-TTR; acquiring, by the remote DSL transceiver, TTR synchronization in accordance with the C-TONES-TTR; upon acquiring TTR synchronization, transmitting, by the remote DSL transceiver, second signals containing even numbered carriers to produce R-TONE-TTR; in response to the R-TONE-TTR, transmitting, by the central office DSL transceiver, second response signals containing odd numbered carriers to produce C-GALF1-TTR; in response to the C-GALF1-TTR, transmitting, by the remote DSL transceiver, third signals containing even numbered carriers to produce R-FLAG1-TTR; and in response to the R-FLAG1-TTR, transmitting, by the central office DSL transceiver, third response signals containing odd numbered carriers to produce C-FLAG1." This embodiment of

claim 1 describes a method to for extending handshaking range in a DSL system by helping to alleviate interference when a binder containing a number of twisted pair wires shared by xDSL modems and TCM-ISDN disturbers.

On page 4, the Office Action admits that the Long reference fails to disclose "transmitting initializing and response to handshaking in odd and even carriers." In fact, the Long reference merely describes a specially defined TTR Indication signal to indicate the boundaries of a FEXT and NEXT bitmap, as described in paragraph 26 of the Long reference, and nowhere discloses the elements of claim 1.

With respect to the Helms reference, the Office Action states in paragraph 5 on page 9 that, "However column 5, lines 50-66 clearly shows this feature as Helm discloses all odd multiple carriers may be used in the downstream path from the central office and even multiple carriers be used in the upstream path (or vice versa)." This statement is taken out of context and mischaracterizes the teachings of the Helms reference. The Helms reference describes aligning the frames transmitted by all CO modems, e.g., all frames transmitted by all CO modems start and end at the same time, as stated at column 6, lines 59 through 66. As stated at column 4, line 61 through column 5, line 8 in the Helms reference:

> "It is a further principle of the present invention to align frames transmitted from the central office toward the subscriber. All frames transmitted by all central office modems are aligned and synchronized to begin at the same time as they are transmitted toward subscribers. That is, all frames transmitted by all central office modems to all subscribers (especially served on the same cable of twisted wire pairs) start and end at the same times. One way to accomplish the alignment is to provide a common shared timing signal to all CO modems from a common source. For example, the signal may comprise a train of narrow, for example, 1 microsecond pulses spaced by the period of a frame (for example, one millisecond). Each central office modem then would align its frames that are transmitted toward respective subscribers over different twisted wire cable pairs with this pulse train.

> The pulse train from the common source may be accompanied by a higher frequency signal (for example, a sinusoid or a pulse train at the frequency specified in Section 6.9 of ANSI T1.413-1995) to which each modem could be synchronized. Alternatively, the pilot tone of 276 kHz specified at Section 6.9.1.2 might be applied as the shared resource. Either alternative will save the costs of providing an oscillator within each central office modem."

In addition, the Helms reference describes that the subscribers' modems are designed to align the frames that it transmits with the frames that it receives so that its transmitted frame coincides with its received frame, at column 7, lines 16 through 20. The Helms reference then later states at column 7, lines 52 through 56, "Optionally, the frequencies used by the central office and subscriber modems can be interspersed – either individually or in groups-to virtually eliminate near end crosstalk (NEXT), provided ***that the frames are aligned as described above*** (emphasis added)." Thus, the Helms reference discloses that the frames must be aligned using some type of pulse train from the common source. This type of alignment precludes the need for DSL handshaking and thus teaches away from the embodiment of DSL handshaking between the remote DSL transceiver and the central office transceiver of claim 1.

The Office Action further states that, "It should further be noted that the use of even numbered carriers for upstream and odd number carriers for downstream is simply a network parameter." However, the claims require more than "a network parameter", and Applicant's respectfully request citation of prior art showing this assertion. Furthermore, the Office Action's reasoning is not the legal basis for obviousness. The proper analysis is whether the claimed invention would have been obvious to one of ordinary skill in the art after consideration of all the facts. See 35 U.S.C. 103(a).

The dependent claims 2 through 7 add further patentable matter to Claim 1 and thus are further differentiated and patentable under 35 U.S.C. §103 over the Long reference in view of the Helms reference.

Independent Claim 8 and Dependent Claims 9 through 12

First, with respect to the Long reference, it fails to disclose or suggest the requirements of claim 8 of, "transmitting first signals containing even numbered carriers for a predetermined

period of time to initiate the DSL handshaking to produce R-ETONES-REQ; receiving first response signals containing odd numbered carriers in accordance with the alignment of a hyperframe to produce C-TONES-TTR; acquiring TTR synchronization in accordance with the C-TONES-TTR; upon acquiring TTR synchronization, transmitting second signals containing even numbered carriers to produce R-TONE-TTR; receiving second response signals containing odd numbered carriers to produce C-GALF1-TTR; and in response to the C-GALF1-TTR, transmitting third signals containing even numbered carriers to produce R-FLAG1-TTR." On page 4, the Office Action admits that the Long reference fails to disclose "transmitting initializing and response to handshaking in odd and even carriers." In fact, the Long reference merely describes a specially defined TTR Indication signal to indicate the boundaries of a FEXT and NEXT bitmap, as described in paragraph 26 of the Long reference and nowhere discloses the elements of claim 8.

With respect to the Helms reference, the Office Action states in paragraph 5 on page 9 that, "However column 5, lines 50-66 clearly shows this feature as Helm discloses all odd multiple carriers may be used in the downstream path from the central office and even multiple carriers be used in the upstream path (or vice versa)." This statement is taken out of context and mischaracterizes the teachings of the Helms reference. The Helms reference describes aligning the frames transmitted by all CO modems, e.g., all frames transmitted by all CO modems start and end at the same time, as stated at column 6, lines 59 through 66. As stated at column 4, line 61 through column 5, line 8 in the Helms reference:

> "It is a further principle of the present invention to align frames transmitted from the central office toward the subscriber. All frames transmitted by all central office modems are aligned and synchronized to begin at the same time as they are transmitted toward subscribers. That is, all frames transmitted by all central office modems to all subscribers (especially served on the same cable of twisted wire pairs) start and end at the same times. One way to accomplish the alignment is to provide a common shared timing signal to all CO modems from a common source. For example, the signal may comprise a train of narrow, for example, 1 microsecond pulses spaced by the period of a frame (for example, one

millisecond). Each central office modem then would align its frames that are transmitted toward respective subscribers over different twisted wire cable pairs with this pulse train.

The pulse train from the common source may be accompanied by a higher frequency signal (for example, a sinusoid or a pulse train at the frequency specified in Section 6.9 of ANSI T1.413-1995) to which each modem could be synchronized. Alternatively, the pilot tone of 276 kHz specified at Section 6.9.1.2 might be applied as the shared resource. Either alternative will save the costs of providing an oscillator within each central office modem."

In addition, the Helms reference describes that the subscribers' modems are designed to align the frames that it transmits with the frames that it receives so that its transmitted frame coincides with its received frame, at column 7, lines 16 through 20. The Helms reference then later states at column 7, lines 52 through 56, "Optionally, the frequencies used by the central office and subscriber modems can be interspersed – either individually or in groups-to virtually eliminate near end crosstalk (NEXT), provided ***that the frames are aligned as described above*** (emphasis added)." Thus, the Helms reference discloses that the frames must be aligned using some type of pulse train from the common source. This type of alignment precludes the need for DSL handshaking and thus teaches away from the embodiment of DSL handshaking between the remote DSL transceiver and the central office transceiver of claim 8.

The Office Action further states that, "It should further be noted that the use of even numbered carriers for upstream and odd number carriers for downstream is simply a network parameter." However, the claims require more than "a network parameter", and Applicant's respectfully request citation of prior art showing this assertion. Furthermore, the Office Action's reasoning is not the legal basis for obviousness. The proper analysis is whether the claimed invention would have been obvious to one of ordinary skill in the art after consideration of all the facts. See 35 U.S.C. 103(a).

The dependent claims 9 through 12 add further patentable matter to Claim 8 and thus are further differentiated and patentable under 35 U.S.C. §103 over the Long reference in view of the Helms reference.

Independent Claim 13 and Dependent Claims 14 through 17

First, with respect to the Long reference, it fails to disclose or suggest the requirements of claim 13 of, "receiving first signals containing even numbered carriers for a predetermined period of time to initiate the DSL handshaking to produce R-ETONES-REQ; detecting the R-ETONES-REQ to produce detected R-ETONES-REQ; determining alignment of a hyperframe in accordance with a Time Compression Multiplexing – Integrated Service Digital Network (TCM-ISDN) Timing Reference (TTR); transmitting first response signals containing odd numbered carriers in accordance with the alignment of the hyperframe to produce C-TONES-TTR; receiving second signals containing even numbered carriers to produce R-TONE-TTR; in response to the R-TONE-TTR, transmitting second response signals containing odd numbered carriers to produce C-GALF1-TTR; receiving third signals containing even numbered carriers to produce R-FLAG1-TTR; and in response to the R-FLAG1-TTR, transmitting third response signals containing odd numbered carriers to produce C-FLAG1." On page 4, the Office Action admits that the Long reference fails to disclose "transmitting initializing and response to handshaking in odd and even carriers." In fact, the Long reference merely describes a specially defined TTR Indication signal to indicate the boundaries of a FEXT and NEXT bitmap, as described in paragraph 26 of the Long reference and nowhere discloses the elements of claim 13.

With respect to the Helms reference, the Office Action states in paragraph 5 on page 9 that, "However column 5, lines 50-66, clearly shows this feature as Helm discloses all odd multiple carriers may be used in the downstream path from the central office and even multiple carriers be used in the upstream path (or vice versa)." This statement is taken out of context and mischaracterizes the teachings of the Helms reference. The Helms reference describes aligning the frames transmitted by all CO modems, e.g., all frames transmitted by all CO modems start and end at the same time, as stated at column 6, lines 59 through 66. As stated at column 4, line 61 through column 5, line 8 in the Helms reference:

> "It is a further principle of the present invention to align frames transmitted from the central office toward the subscriber. All frames transmitted by all central office modems are aligned and synchronized to begin at the same time as they are transmitted toward subscribers. That is, all frames transmitted by all central office

modems to all subscribers (especially served on the same cable of twisted wire pairs) start and end at the same times. One way to accomplish the alignment is to provide a common shared timing signal to all CO modems from a common source. For example, the signal may comprise a train of narrow, for example, 1 microsecond pulses spaced by the period of a frame (for example, one millisecond). Each central office modem then would align its frames that are transmitted toward respective subscribers over different twisted wire cable pairs with this pulse train.

The pulse train from the common source may be accompanied by a higher frequency signal (for example, a sinusoid or a pulse train at the frequency specified in Section 6.9 of ANSI T1.413-1995) to which each modem could be synchronized. Alternatively, the pilot tone of 276 kHz specified at Section 6.9.1.2 might be applied as the shared resource. Either alternative will save the costs of providing an oscillator within each central office modem."

In addition, the Helms reference describes that the subscribers' modems are designed to align the frames that it transmits with the frames that it receives so that its transmitted frame coincides with its received frame, at column 7, lines 16 through 20. The Helms reference then later states at column 7, lines 52 through 56, "Optionally, the frequencies used by the central office and subscriber modems can be interspersed – either individually or in groups-to virtually eliminate near end crosstalk (NEXT), provided ***that the frames are aligned as described above*** (emphasis added)." Thus, the Helms reference discloses that the frames must be aligned using some type of pulse train from the common source. This type of alignment precludes the need for DSL handshaking and thus teaches away from the embodiment of DSL handshaking between the remote DSL transceiver and the central office transceiver of claim 13.

The Office Action further states that, "It should further be noted that the use of even numbered carriers for upstream and odd number carriers for downstream is simply a network parameter." However, the claims require more than "a network parameter", and Applicant's respectfully request citation of prior art showing this assertion. Furthermore, the Office Action's reasoning is not the legal basis for obviousness. The proper analysis is whether the claimed

invention would have been obvious to one of ordinary skill in the art after consideration of all the facts. See 35 U.S.C. 103(a).

The dependent claims 14 through 17 add further patentable matter to Claim 13 and thus are further differentiated and patentable under 35 U.S.C. §103 over the Long reference in view of the Helms reference.

Independent Claim 18 and Dependent Claims 19 through 22

First, with respect to the Long reference, it fails to disclose or suggest the requirements of claim 18 of, "memory operably coupled to the processing module, wherein the memory stores operational instructions that cause the processing module to: transmit first signals containing even numbered carriers for a predetermined period of time to initiate the DSL handshaking to produce R-ETONES-REQ; receive first response signals containing odd numbered carriers in accordance with the alignment of a hyperframe to produce C-TONES-TTR; acquire TTR synchronization in accordance with the C-TONES-TTR; upon acquiring TTR synchronization, transmit second signals containing even numbered carriers to produce R-TONE-TTR; receive second response signals containing odd numbered carriers to produce C-GALF1-TTR; and in response to the C-GALF1-TTR, transmit third signals containing even numbered carriers to produce R-FLAG1-TTR." On page 4, the Office Action admits that the Long reference fails to disclose "transmitting initializing and response to handshaking in odd and even carriers." In fact, the Long reference merely describes a specially defined TTR Indication signal to indicate the boundaries of a FEXT and NEXT bitmap, as described in paragraph 26 of the Long reference and nowhere discloses the elements of claim 18.

With respect to the Helms reference, the Office Action states in paragraph 5 on page 9 that, "However column 5, lines 50-66, clearly shows this feature as Helm discloses all odd multiple carriers may be used in the downstream path from the central office and even multiple carriers be used in the upstream path (or vice versa)." This statement is taken out of context and mischaracterizes the teachings of the Helms reference. The Helms reference describes aligning the frames transmitted by all CO modems, e.g., all frames transmitted by all CO modems start and end at the same time, as stated at column 6, lines 59 through 66. As stated at column 4, line 61 through column 5, line 8 in the Helms reference:

"It is a further principle of the present invention to align frames transmitted from the central office toward the subscriber. All frames transmitted by all central office modems are aligned and synchronized to begin at the same time as they are transmitted toward subscribers. That is, all frames transmitted by all central office modems to all subscribers (especially served on the same cable of twisted wire pairs) start and end at the same times. One way to accomplish the alignment is to provide a common shared timing signal to all CO modems from a common source. For example, the signal may comprise a train of narrow, for example, 1 microsecond pulses spaced by the period of a frame (for example, one millisecond). Each central office modem then would align its frames that are transmitted toward respective subscribers over different twisted wire cable pairs with this pulse train.

The pulse train from the common source may be accompanied by a higher frequency signal (for example, a sinusoid or a pulse train at the frequency specified in Section 6.9 of ANSI T1.413-1995) to which each modem could be synchronized. Alternatively, the pilot tone of 276 kHz specified at Section 6.9.1.2 might be applied as the shared resource. Either alternative will save the costs of providing an oscillator within each central office modem."

In addition, the Helms reference describes that the subscribers' modems are designed to align the frames that it transmits with the frames that it receives so that its transmitted frame coincides with its received frame, at column 7, lines 16 through 20. The Helms reference then later states at column 7, lines 52 through 56, "Optionally, the frequencies used by the central office and subscriber modems can be interspersed – either individually or in groups-to virtually eliminate near end crosstalk (NEXT), provided ***that the frames are aligned as described above*** (emphasis added)." Thus, the Helms reference discloses that the frames must be aligned using some type of pulse train from the common source. This type of alignment precludes the need for DSL handshaking and thus teaches away from the embodiment of DSL handshaking between the remote DSL transceiver and the central office transceiver of claim 18.

The Office Action further states that, "It should further be noted that the use of even numbered carriers for upstream and odd number carriers for downstream is simply a network parameter." However, the claims require more than "a network parameter", and Applicant's respectfully request citation of prior art showing this assertion. Furthermore, the Office Action's reasoning is not the legal basis for obviousness. The proper analysis is whether the claimed invention would have been obvious to one of ordinary skill in the art after consideration of all the facts. See 35 U.S.C. 103(a).

The dependent claims 19 through 22 add further patentable matter to Claim 18 and thus are further differentiated and patentable under 35 U.S.C. §103 over the Long reference in view of the Helms reference.

Independent Claim 23 and Dependent Claims 24 through 27

First, with respect to the Long reference, it fails to disclose or suggest the requirements of claim 23 of, "memory operably coupled to the processing module, wherein the memory stores operational instructions that cause the processing module to: receive first signals containing even numbered carriers for a predetermined period of time to initiate the DSL handshaking to produce R-ETONES-REQ; detect the R-ETONES-REQ to produce detected R-ETONES-REQ; determine alignment of a hyperframe in accordance with a Time Compression Multiplexing – Integrated Service Digital Network (TCM-ISDN) Timing Reference (TTR); transmit first response signals containing odd numbered carriers in accordance with the alignment of the hyperframe to produce C-TONES-TTR; receive second signals containing even numbered carriers to produce R-TONE-TTR; in response to the R-TONE-TTR, transmit second response signals containing odd numbered carriers to produce C-GALF1-TTR; receive third signals containing even numbered carriers to produce R-FLAG1-TTR; and in response to the R-FLAG1-TTR, transmit third response signals containing odd numbered carriers to produce C-FLAG1." On page 4, the Office Action admits that the Long reference fails to disclose "transmitting initializing and response to handshaking in odd and even carriers." In fact, the Long reference merely describes a specially defined TTR Indication signal to indicate the boundaries of a FEXT and NEXT bitmap, as described in paragraph 26 of the Long reference and nowhere discloses the elements of claim 23.

With respect to the Helms reference, the Office Action states in paragraph 5 on page 9 that, "However column 5, lines 50-66, clearly shows this feature as Helm discloses all odd multiple carriers may be used in the downstream path from the central office and even multiple carriers be used in the upstream path (or vice versa)." This statement is taken out of context and mischaracterizes the teachings of the Helms reference. The Helms reference describes aligning the frames transmitted by all CO modems, e.g., all frames transmitted by all CO modems start and end at the same time, as stated at column 6, lines 59 through 66. As stated at column 4, line 61 through column 5, line 8 in the Helms reference:

> "It is a further principle of the present invention to align frames transmitted from the central office toward the subscriber. All frames transmitted by all central office modems are aligned and synchronized to begin at the same time as they are transmitted toward subscribers. That is, all frames transmitted by all central office modems to all subscribers (especially served on the same cable of twisted wire pairs) start and end at the same times. One way to accomplish the alignment is to provide a common shared timing signal to all CO modems from a common source. For example, the signal may comprise a train of narrow, for example, 1 microsecond pulses spaced by the period of a frame (for example, one millisecond). Each central office modem then would align its frames that are transmitted toward respective subscribers over different twisted wire cable pairs with this pulse train.
>
> The pulse train from the common source may be accompanied by a higher frequency signal (for example, a sinusoid or a pulse train at the frequency specified in Section 6.9 of ANSI T1.413-1995) to which each modem could be synchronized. Alternatively, the pilot tone of 276 kHz specified at Section 6.9.1.2 might be applied as the shared resource. Either alternative will save the costs of providing an oscillator within each central office modem."

In addition, the Helms reference describes that the subscribers' modems are designed to align the frames that it transmits with the frames that it receives so that its transmitted frame coincides with its received frame, at column 7, lines 16 through 20. The Helms reference then

later states at column 7, lines 52 through 56, "Optionally, the frequencies used by the central office and subscriber modems can be interspersed – either individually or in groups-to virtually eliminate near end crosstalk (NEXT), provided ***that the frames are aligned as described above*** (emphasis added)." Thus, the Helms reference discloses that the frames must be aligned using some type of pulse train from the common source. This type of alignment precludes the need for DSL handshaking and thus teaches away from the embodiment of DSL handshaking between the remote DSL transceiver and the central office transceiver of claim 22.

The Office Action further states that, "It should further be noted that the use of even numbered carriers for upstream and odd number carriers for downstream is simply a network parameter." However, the claims require more than "a network parameter", and Applicant's respectfully request citation of prior art showing this assertion. Furthermore, the Office Action's reasoning is not the legal basis for obviousness. The proper analysis is whether the claimed invention would have been obvious to one of ordinary skill in the art after consideration of all the facts. See 35 U.S.C. 103(a).

The dependent claims 23 through 27 add further patentable matter to Claim 22 and thus are further differentiated and patentable under 35 U.S.C. §103 over the Long reference in view of the Helms reference.

CONCLUSION

The Office Action indicated that claims 2, 4, 6, 7, 9, 12, 14, 15, 16, 17, 19, 22 and 24-27 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. For the above reasons, the other claims 1, 3, 5, 8, 11, 13, 18, 20, 21 and 23 are patentable as well, and the rejections of these claims should be withdrawn. Therefore, it is respectfully requested that the rejection of the claims be withdrawn and full allowance granted. Should the Examiner have any further comments or suggestions, please contact Jessica Smith at (972) 240-5324.

Respectfully submitted,

GARLICK, HARRISON & MARKISON

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